ALUMINUM COMPANY OF AMERICA
DAVENPORT WORKS

ADDENDUM 1 - OIL COLLECTION SYSTEM

TO

CLOSURE PLAN - WASTE OIL SURFACE IMPOUNDMENT DATED 1982 MARCH 1

M. K. Sonksen
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INDEX

ADDENDUM 1 - OIL COLLECTION SYSTEM

1.0 BACKGROUND

2.0 OIL COLLECTION SYSTEM

2.1 Location of Collection Trench

2.2 Description of Collection Trench

2.3 French Drain

2.4 Waste Oil Storage Facilities

2.5 Construction Waste Products

2.51 Normal, Dry Excavated Material

2.52 Oil Soaked Material

2.53 Water Soaked Material

2.54 Free Water

2.55 Free Oil

3.0 CLAY CAP

4.0 EQUIPMENT CLEANUP

5.0 OPERATION

5.1 Oil Collection System

5.2 Maintenance

6.0 GROUNDWATER MONITORING

3-05-05.11
1.0 Background

In 1956, a waste oil surface impoundment was started at Davenport Works for the storage of waste oils from its manufacturing operations. In 1979, it was discovered that the impoundment contained polychlorinated biphenyls (PCBs). Efforts were begun immediately to eliminate the impoundment in a manner consistent with applicable regulations.

Following extensive testing, detailed in "Closure Plan - Waste Oil Surface Impoundment" (1) dated 1982 March 1, PCB contaminated material was either removed from the lagoon for disposal in an EPA approved facility in Alabama or solidified on-site with cement dust. (2) From 1981 January 07 through 1981 June 07, approximately 1.72 million gallons of contaminated oil was removed from the site for disposal in Alabama. In addition, as the liquid was removed, approximately 17,000 tons of cement dust were used to solidify the remaining sludge. Solidification was completed on 1981 December 17.

In recognition of the fact that the surface impoundment was unlined, Alcoa obtained the services of Geraghty and Miller, Inc., Groundwater Geologists and Hydrologists, in 1981 January to conduct a site assessment of hydrogeologic conditions around the impoundment. The assessment (3) confirmed that leakage from the impoundment was being caused by elevated liquid levels in the lagoon.

Based on this original assessment, Geraghty and Miller was retained to continue their study to more accurately describe conditions around the lagoon and to recommend remedial actions if required. This continued study is detailed in Geraghty and Miller's subsequent quarterly reports (4, 5, 6) and in their first annual report (7). Their final conclusions were that oil continues to leach from the saturated soil around the solidified lagoon at an estimated rate of 11.5 gallons/day, carrying with it an estimated 0.67 pounds per day of PCB's. In addition, an estimated 0.037 pounds/day of PCB's are being discharged in the 15,300 gallons of groundwater leaving the site each day. The seepage, in general, is in the direction of natural groundwater flow for the area; south towards the Mississippi River.
Because of this seepage, Alcoa has decided to install an interceptor trench along the south side of the lagoon area along with an impermeable cap to reduce this discharge. Installation of the trench is being planned at this time, to coincide with installation of the clay cap, so as to avoid disturbing the cap at some future date.

2.0 Oil Collection System

2.1 Location of Collection Trench

The oil collection trench will be installed along the south and south western edge of the lagoon area; between the lagoon and the river. Its approximate position is shown on Exhibit A.

2.2 Description of Collection Trench

The proposed oil collection trench will be approximately 1700 feet long. It will be installed to or below natural bedrock for its entire length. This will locate the bottom of the trench at elevations ranging from approximately 558 feet to 563 feet. Top of the trench area, when completed, will be covered with clay, (compacted to 90 percent of modified proctor density), loam soil, and vegetation in accordance with the Closure Plan dated 1981 March 3.

The downgradient side of the trench will have a high density polyethylene (HDP) liner installed from elevation 571.0 feet down to an elevation below the existing minimum groundwater level in the area. The liner will stop and hold any oil floating on the groundwater table. Water from the bottom section of the trench will pass under HDP liner; oil trapped in the trench will be removed for disposal.

3-05-05.2
Installed at several key locations in the trench will be oil skimming pumps. These will remove the oil collected in the trench for disposal. As this oil layer is removed, an oil-gradient will be produced towards the trench, enhancing movement of additional oil in the surrounding soil towards the trench.

2.3 French Drain
A French Drain, approximately 120 feet long and installed to bedrock, was installed along the west edge of the lagoon area several years ago. This drain will be eliminated since the collection trench includes the area covered by the French drain.

2.4 Waste Oil Storage Facilities
Piping will be installed to connect each oil skimming pump to an oil storage tank. Oil will be accumulated in a buried oil storage tank until a truckload quantity has been collected. The tank will be buried in a location upgradient and near the collection trench. In the unlikely event that the tank should develop a leak, leakage would flow into the trench for collection. An above-ground standpipe will be provided on the tank to permit periodic level measurement.

2.5 Construction Waste Products
Precise information on the amount or condition of material to be removed during excavation of the trench is unknown at this time. Conditions will only become known once excavation begins.

The trench, by design, will be installed into the groundwater table. It is expected, therefore, to generate as excavation spoil a variety of materials. This will probably include; 1) normal, dry sandy silt from the upper elevations, 2) oil soaked material from near the top of the water table in some areas, 3) wet soils from the bottom part of the excavation, 4) water and/or, 5) oil that will leach into the trench during construction.

3-05-05.3
Estimates at this time are that a total of 14,000 cubic yards of material may be excavated for the 1700 foot trench. An estimated 12,000 cubic yards of soil-type material will be required to backfill after installation of approximately 3,400 cubic yards of drainage rock. This will result in approximately 2,000 cubic yards extra of material removed from the trench area that will require relocation. This section will discuss handling and/or disposal practices to be followed for each type of material expected to be encountered.

2.51 Normal, Dry, Silt: This material will be stockpiled during excavation of the trench and will be used for backfill over the drainage rock in the trench.

2.52 Oil Soaked Material: Excavation at deeper depths will likely generate some volume of material that contains significant quantities of oil. This material will be deposited on the lagoon site. It will be placed in a position on the site, upgradient from the trench, so that any oil that may subsequently leach from the material will enter and be collected by the trench. If sufficient quantities of this material are encountered, some shallow excavation on the lagoon site may be done to establish a location for its placement so that the final elevation will not be so high as to interfere with installation of the final cap.

In the event that a significant volume of oil soaked material is removed that is saturated to the point of being soupy or mushy, waste cement dust will be added to fix the material and minimize future leaching.

Care will be exercised in placing this material in a location upgradient from the trench and in an area to receive the impermeable clay cap.

2.53 Water Soaked Material: Excavation of material from within the water table, and beneath any oil layer that may be present, will also be deposited on the lagoon site. It will be deposited at a location upgradient from the trench and will ultimately be covered with the clay cap.
In the event that a significant volume of water saturated material is removed that is soupy, a containment area may have to be provided on site to contain any water that may separate from the material. This may be constructed by building small dikes, excavating a shallow hole, or a combination of the two. The water soaked material will be left exposed to the sun to dry somewhat before covering it with the clay cap. If sufficient natural drying does not occur, waste cement dust may be required to stabilize the material prior to capping.

2.54 Free Water: If a significant quantity of free water is encountered when excavating below the water table, it may have to be pumped out to permit continuation of the work. If this occurs, a diked and/or shallow excavated area will be provided elsewhere on the site. Free water will be pumped into this containment area for evaporation and absorption. This area will be upgradient of the trench, within the confines of the area to be capped, so that any oil that may be removed from the trench while pumping water, along with any oil the water may tend to leach from the site as the water soaks in, will either enter the trench for removal or be entrapped under the impermeable clay cap.

Care will be exercised when pumping any water from the trench so as to minimize the amount of free oil removed.

2.55 Free Oil: While excavating on some areas of the site, sufficient quantities of oil may leach into the excavated area so that removal is necessary to continue work. Any oil that leaches into the trench during excavation that must be removed to continue work will be removed and accumulated for off-site disposal. Accumulation may be in a temporary tank, drums, or directly in a tank truck, depending on the quantity removed. Oil removed from the trench will be pumped or skimmed from 3-05-05.
the surface to minimize water removal. If some separable water is removed along with the oil, it will be drained from the oil while in the storage containers. Water drained from the oil in this manner will be disposed on site per section 2.54 above.

Free oil accumulated for disposal will be analyzed for PCB content. If PCB levels are 500 ppm or higher, disposal will be via off-site incineration in an EPA approved facility. Oil collected that has a PCB content less than 500 ppm will either be disposed off-site in an EPA approved facility or added to Alcoa's on-site storage tanks for ultimate disposal through the EPA approved #14 melting furnace. Disposal in the #14 furnace is subject to specific approval of the Regional Administrator, EPA Region VII. This approval will be requested if on-site disposal is considered.

3.0 IMPERMEABLE CAP

Following installation of the oil collection system, the lagoon area will be graded for drainage, covered with an impermeable clay cap, loam, topsoil, and seeded as stated in the Closure Plan. This graded and/or capped area will include the area in which the trench is installed.

Installation of the clay cap, in conjunction with installation of the oil collection system, will provide several advantages over installation of an oil collection system only. These advantages were presented in 1983 April 21 letter report from Geraghty and Miller discussing their evaluation of the oil collection system, capping, or a combination of the two.

The main advantage of the capped site, in conjunction with the oil collection system is that it will reduce infiltration of meteoric water (annual precipitation). Reduction of the meteoric water, in turn, will reduce the generation of contaminated groundwater since the infiltrating water must pass through the overlying contaminated oil layer in order to reach the groundwater table. In 3-05-05.6
addition, as meteoric water is excluded, the fluid mounding in the site will be reduced, thus reducing the hydraulic gradient driving oil and groundwater from the site. Most significantly, this reduction in hydraulic head will reduce the vertical flow of contaminated groundwater into underlying units which, otherwise, would go uncontrolled. Reduction of the hydraulic mound will also reduce the amount of contaminated oil currently being forced radially from the site; some of which could escape collection in the oil collection system. Over time, with the cap in place, the natural hydraulic gradient towards the river should be reestablished; driving the oil layer in the direction of the collection trench and increasing the overall efficiency of the collection system.

Installation of the HDP liner on the downgradient side of the oil collection trench will, to some extent, impede normal movement of groundwater through the site. This restriction to flow will tend to increase groundwater levels in the site, with the potential that some fluids may be forced around the collection system. Installation of the cap, and the subsequent reduction in meteoric infiltration, will counteract this unpredictable head buildup.

The main disadvantage of installing an impermeable clay cap at this time is that it will reduce the rate at which PCB contaminated oil will move from the site. This reduction will increase the time period over which the oil collection system must be maintained operational; perhaps by several years. The advantages discussed above, however, outweigh this disadvantage. Installation of a clay cap at the time the oil collection system is installed will provide an integrated system that will contain, and ultimately remove from the environment, the maximum amount of PCB contaminated oil and, also, reduce the generation and subsequent discharge of other organic contaminants in the groundwater.
4.0 EQUIPMENT CLEANUP

Following use, any equipment used in the excavation of the trench that came in contact with oil, soil, or water that contains PCBs in excess of 50 ppm will be cleaned in accordance with 40 CFR 761.79 before being removed from the site or used on other work on the site. The internal surfaces of pumps or pipes were exposed to materials contaminated above 50 ppm PCBs will be decontaminated by continuously recylcing a solvent meeting the criteria of 40 CFR 761.79 (a) for a period of one hour or longer.

5.0 OPERATION & MAINTENANCE OF COMPLETED COLLECTION SYSTEM

5.1 Operation

Oil collected and removed from the trench with the oil skimming pumps will be pumped into the waste oil storage tank until a truckload quantity has been accumulated. When sufficient quantity has been accumulated for disposal, tests will be conducted to determine the PCB content. The waste oil will then be disposed off-site in an EPA approved facility if the PCB content is greater than 500 ppm. In the event that accumulated oil contains PCBs at concentrations between 50 and 500 ppm, the oil will either be disposed off-site in an EPA approved facility or disposed by incineration in our #14 melting furnace which has EPA approval for PCB destruction. If on-site incineration is considered for any oil, approval will be requested from the Regional Administrator prior to removing the oil from the oil storage tank.

5.2 Maintenance

Sufficient parts and/or pumps will be established as on-hand spares to enable continual maintenance of the oil skimming pumps and overall collection system. A written inspection plan will also be prepared for internal use and control to assure that the oil collection system is maintained in operational condition.

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It is unknown at this time how long operation of the trench and oil collection system will need to continue. At a minimum, the oil collection system will be maintained operational as long as sufficient quantities of oil accumulates in the trench and sumps for collection. Prior to discontinuing operation of the collection system, a report will be submitted to the EPA, Region VII Regional Administrator, summarizing current performance of the system and stating Alcoa's reasons for wanting to discontinue operation of the system. Operation will not be stopped until agreement is reached with the Regional Administrator.

Although it is not known exactly how long it will take for oil in the site to be removed to an acceptable level, Alcoa realizes that the time period may be significant, ranging from ten (10) to perhaps 30 years or more. The commitment being made to install, maintain, and operate an oil collection system is made with the understanding that it is a long-term commitment.

6.0 GROUNDWATER MONITORING

Monitoring wells were installed around the lagoon area in February 1981. Since that time, Geraghty and Miller, Inc. has been collecting samples from selected wells on a regular basis. Results from the monitoring are summarized in quarterly reports throughout the year. Each year an annual report is submitted by Geraghty and Miller that summarizes the data and presents their evaluation as indicated by the past years' data.

Following installation of the oil collection system and cap, monitoring will continue based on a schedule agreed upon between Alcoa and the USEPA. Monitoring will continue until Alcoa and the EPA mutually agree that groundwater conditions have improved and stabilized to the point that monitoring is no longer required. Any modification to an agreed upon monitoring plan will only be made after mutual agreement of any changes.

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